



CITY OF SCOTTSDALE

SCOTTSDALE FIRE DEPARTMENT

Interpretations And Applications of NFPA 13R (2007 edition) EFFECTIVE: September 1, 2007

ORIGIN & DEVELOPMENT OF THE FIRE SPRINKLER ORDINANCE IN THE CITY OF SCOTTSDALE

The City of Scottsdale and Rural/Metro Fire Department held extensive fire sprinkler tests in 1982. The resulting tests demonstrated the reliability of listed residential quick response sprinkler heads to significantly reduce the potential for loss of life and property damage that can result from a fire.

On June 4th, 1985, the Scottsdale City Council passed an ordinance requiring all new building permits obtained for commercial and multi-family structures to be provided with an approved automatic fire sprinkler system.

New building permits obtained after January 1, 1986 for single family dwellings requires the installation of an approved automatic residential fire sprinkler system.

*Sprinklers typically reduce the chances of dying in a home fire by one half to two thirds in any kind of property where they are used. Together with [smoke alarms](#) , sprinklers cut the risk of dying in a home fire 82 percent, relative to having neither.

The Interpretations and Applications Manual describes the requirements for the installation of automatic fire sprinkler systems for the current adopted standards of NFPA 13R.

* NFPA Link:

<http://www.nfpa.org/itemDetail.asp?categoryID=276&itemID=18249&URL=Research%20&%20Reports/Fact%20sheets/Fire%20protection%20equipment/Automatic%20sprinkler%20sy>

CONTENTS

2007 NFPA 13R

Chapter 5	System Components
5.4	Fire Riser Components & Location
Chapter 6	Working Plans, Design, Installation, Acceptance Tests and Maintenance
6.2.3	Submittal Requirements
6.2.7	Working Plans
6.4.3	Tests and Inspections
6.4.3.1	Rough-in Inspection
6.4.3.2	Final Inspection
6.4.3.3	Re-inspection Fees
6.4.7	CPVC Certification
6.5.2.1	Solvent Cement
6.6.1.1	Fireline
6.7.1.6	Backflow
6.7.1.7	Tampered Control Valve & Flow Switch
6.7.3.5	Inspector's Test Valve
6.7.4.1	Fire Department Connections
6.7.8.4	Alarms
6.7.8.5	Alarms
6.7.8.6	Monitoring
6.8.3.2	Design Criteria – Garages
6.8.3.3	Design Criteria – Garages
6.8.5	Flow Switch Loss
6.8.6	Pressure Safety Margin
6.9.1	Location of Sprinklers
6.9.5	Location of Sprinklers
6.9.6	Location of Sprinklers
6.9.6.1	Location of Sprinklers
6.9.1	Location of Sprinklers



INTERPRETATIONS & APPLICATIONS **OF THE 2007 MODIFIED NFPA 13-R**

Revised: 09-01-07

CHAPTER 5 – SYSTEM COMPONENTS

5.4 FIRE RISER COMPONENTS & LOCATION *ADDED*

- (1) The fire riser shall be at an accessible location approved by the fire code official from a fire access road or driveway.
- (2) The fire riser shall be constructed within a cabinet or other secured location as approved by the fire code official.
- (3) An access panel or door suitable for access to all riser components shall be provided.
- (4) Plastic systems shall be protected from damage up to 7'0" from floor level.
- (5) Building number identification shall be provided at the riser location.
- (6) Hydraulic calculation data plate shall be required.

CHAPTER 6 – WORKING PLANS, DESIGN, INSTALLATION, ACCEPTANCE TESTS AND MAINTENANCE

6.2.3 SUBMITTAL REQUIREMENTS *AMENDED*

New construction and remodel plans submitted to the City shall comply with the following:

- (1) Submit a minimum of 3 sets of all working drawings
- (2) Submit one set of hydraulic calculations and manufacturer data sheets for all equipment, i.e. sprinkler heads and approved backflow prevention.
- (3) Acceptable paper size shall be limited to 24 x 36 or 30 x 42, minimum scale shall be 1/8"
- (4) All submittals shall bear a dated review certification and signature of a minimum level III NICET certified engineering technician (CET) automatic sprinkler systems or an Arizona Registered Professional Engineer
- (5) Deviations from approved plans will require approval of the fire code official.

For digital plan submittals; see the City of Scottsdale website at:
<http://www.scottsdaleaz.gov/bldgresources/digital.asp>

6.2.7 WORKING PLANS *AMENDED*

- (1) Hydraulic calculation data
- (2) Ceiling heights; ceiling height changes
- (3) Sloped ceilings exceeding 2:12. Indicate "no sloped ceilings" if applicable
- (4) Beam sizes and soffit depths
- (5) Dimensioning of heads as necessary for determining proper head spacing

- (6) Clearly identified calculated areas (On plans & calculations)
- (7) Inspector's test
- (8) Riser location
- (9) Riser detail
- (10) General notes as required
- (11) City of Scottsdale Flow Test Summary Form at:
<http://www.scottsdaleaz.gov/bldgresources/forms.asp#f>

6.4.3 TEST AND INSPECTIONS ADDED

6.4.3.1 ROUGH-IN INSPECTION ADDED

- (1) All tests shall be witnessed by Scottsdale Fire Department.
- (2) All components of the system shall be in place, secured and connected to the water supply at the time of the test.
- (3) All fire penetrations should be filled with approved material and nail plates shall be in place at the time of the pressure test. Where metal studs are used piping shall be protected with either a sleeve or grommet.
- (4) Systems tested with sprinkler heads installed at time of test may have up to 10% of the heads removed for orifice obstruction inspection. (Not required if plugs are used) If solvent glue or other foreign objects are found within the sprinkler head at time of inspection, then the system shall be tested using plugs in lieu of sprinkler heads. The sprinkler contractor will then be required to install all sprinkler systems using plugs in lieu of sprinkler heads for a period of one year from that date for each rough inspection.
- (5) An approved set of sprinkler plans shall be on the job site at the time of inspection.

6.4.3.2 FINAL INSPECTION ADDED

- (1) At the final inspection all sprinkler system components shall be in place, and the system shall be flowed with the activation of the flow switch and bell
- (2) All risers shall have a hydraulic data nameplate in accordance with NFPA 13.
- (3) Spare sprinkler heads shall be located in a spare head cabinet with sprinkler head wrench at an approved location by fire inspection personnel
- (4) Fire Department Inspection form from rough-in inspection must be on the job site at the time of test if there was a stipulation for rough-in approval
- (5) Activation of alarm notification appliances by flow test and tamper switch
- (6) Verify manufacturers head tolerance with the escutcheon in place and check for paint, obstructions, plaster, etc.
- (7) Labels for inspectors test, auxiliary control valves, etc. shall be in place
- (8) Dwelling unit identification and/or building diagram shall be in place at each riser

6.4.3.3 RE-INSPECTION FEES ADDED

A re-inspection fee may be assessed for each inspection or re-inspection, not limited to the following:

- (1) When installation is not complete.
- (2) When corrections from previous inspection are not complete.
- (3) When two or more appointments have been cancelled at the same address.
- (4) Late notice of cancellation. (less than 2 hrs prior)

6.4.7 CPVC CERTIFICATION *ADDED*

When installing CPVC piping, the factory issued certification card must be carried by the pipe fitter during installation and is to be made available to an inspector upon request.

6.5.2.1 SOLVENT CEMENT *ADDED*

The head adaptor/drop nipple assembly shall be pre-fabricated prior to installation to ensure the sprinkler orifice remains free of obstructions.

6.6.1.1 FIRELINE *ADDED*

A separate fireline shall be required to supply each fire riser assembly. The hydraulic calculations shall determine the pipe size.

6.7.1.6 BACKFLOW *AMENDED*

All fire sprinkler risers shall incorporate a UL listed or FM approved vertical double check backflow preventer.

6.7.1.7 TAMPERED CONTROL VALVE & FLOW SWITCH *ADDED*

A separate tampered control valve shall be required for each floor. The tampered control valve shall ring the bell when sprinkler monitoring or a fire alarm system is not required.

A separate tampered control valve and flow switch shall be required for each floor when sprinkler monitoring or a fire alarm system is required. Tampered control valves shall be zoned separately for each building and floor.

Exception: When a single dwelling unit occupies multiple floors, separate tampered control valves and flow switches may not be required. Written approval from the fire code official shall be obtained for this exception.

6.7.3.5 INSPECTORS' TEST VALVE *ADDED*

- (1) When a flow switch is required for per floor, each sprinkler system shall have an inspector's test valve and drain connected at the highest most remote possible point in the system for one & two floor occupancies.
- (2) When a flow switch is required per floor for 3 or more floors, the inspectors test connection shall be made at the individual floor remote area and connected into a common drain to allow separate testing of each floor.
- (3) Piping to the test valve will be the same size as piping to the most remote sprinkler head.

6.7.4.1 FIRE DEPARTMENT CONNECTIONS *AMENDED*

A fire department connection (FDC) shall be installed in an accessible location approved by the fire code official from a fire access road or driveway. The FDC shall be located directly beneath the alarm bell.

6.7.4.2 FIRE DEPARTMENT CONNECTIONS *AMENDED*

Fire department connections shall be at least 1-1/2 inches; National Standard (Male) Thread.

6.7.8.4 ALARMS *AMENDED*

Where a building fire alarm or sprinkler monitoring system is provided, the building fire sprinkler system shall be required to be zoned per floor.

6.7.8.5 ALARMS *ADDED*

Local water flow alarms shall be provided on all sprinkler systems as follows:

- (1) A 110 volt AC 6 inch minimum size electric bell
- (2) The bell shall be mounted on the exterior of the structure, facing the street and mounted directly above the F.D.C.
- (3) The bell must be at a height to view easily from the street or drive and no higher than the plane made by the bottom of the eaves
- (4) The alarm shall receive its' signal from a UL listed local water flow switch
- (5) Color: Red

6.7.8.6 MONITORING *ADDED*

Monitoring of the fire sprinkler system shall be required in buildings that have 100 or more sprinkler heads installed.

6.8.3.2 DESIGN CRITERIA – GARAGES *AMENDED*

Garages that are accessible by people by more than one dwelling unit, and are not covered by 6.8.3.1, shall be considered part of the building and shall be protected in accordance with 6.8.2. Garage doors shall be considered obstructions and shall not be permitted to be ignored for placement and calculation of sprinklers.

6.8.3.3 DESIGN CRITERIA – GARAGES *AMENDED*

Garages that are accessible only from a single dwelling unit shall be considered as part of that dwelling unit. Such garages shall be sprinklered with residential sprinklers in accordance with 6.8.1 or quick-response sprinklers designed to provide a density of 0.05 gpm/ft² (2.04 mm/min) over the area of the garage, but not to exceed four sprinklers. Garage doors shall be considered obstructions and shall not be permitted to be ignored for placement and calculation of sprinklers.

6.8.5 FLOW SWITCH LOSS *ADDED*

Pipe sizes 2" or less shall include 3 PSI fixed loss for the flow switch, or per manufacturer specifications.

6.8.6 PRESSURE SAFETY MARGIN *ADDED*

- (1) Calculations shall maintain a 10% pressure safety margin from the field water pressure tests.
- (2) The pressure used for hydraulic calculations shall not exceed 72 psi.

- (3) When additional fittings have been installed in a sprinkler system not accounted for in the design, revised drawings may be required with new calculations.

6.9.1 LOCATION OF SPRINKLERS *AMENDED*

Sprinklers shall be installed in all areas except where omission is permitted by 6.9.3 & 6.9.6 as amended.

6.9.5 LOCATION OF SPRINKLERS *AMENDED*

Sprinklers shall be required on porches, balconies & corridors.

Exception: Sprinklers may be omitted from non-combustible porches, balconies, 48" or less in width.

6.9.6 LOCATION OF SPRINKLERS *AMENDED*

Attics shall be deleted from the omissions.

6.9.6.1 LOCATION OF SPRINKLERS *ADDED*

Attics shall be provided with sprinkler protection in accordance with NFPA 13; hydraulically calculated area of 900 sq. feet. Copper or steel sprig-ups are permitted off CPVC in 13-R installations where attic protection is not otherwise required by other codes or standards. CPVC sprig-ups are not permitted.